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#4
17 April 2002
F. Talleur
INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ



I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

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Signed

Dated

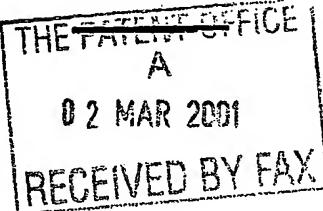
28 January 2002

Patents Form 1/77

Patent Act 1977
(Rule 16)The
Patent
Office02MAR01 E61026-1 D01268
P01/7700 0.00 105126.7

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form).



The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference	EAL/AH-P/6097.GBA		
2. Patent application number (The Patent Office will fill in this part)	0105126.7 2 MAR 2001		
3. Full name, address and postcode of the or of each applicant (underline all surnames)	LAND INSTRUMENTS INTERNATIONAL LIMITED Dronfield Sheffield S18 6DJ		
39790 69001			
Patents ADP number (if you know it)			
If the applicant is a corporate body, give the country/state of its incorporation		GB	
4. Title of the invention	GAS SAMPLE PROBE FOR A GAS ANALYSER		
5. Name of your agent (if you have one)	Hulse & Co St James House, 8th Floor Vicar Lane Sheffield S1 2EX		
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)		885002	
6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of filing (day/month/year)
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application		Date of filing (day/month/year)
8. Is a statement of inventorship and the right to grant of a patent required in support of this request? (Answer 'Yes' if: a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d).	YES		

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form.
Do not count copies of the same document

Continuation sheets of this form

Description	2
Claim(s)	-
Abstract	-
Drawing(s)	1 sheet (informal)

Op 1 set

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of Inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/99)

Request for substantive examination (Patents Form 10/77)

Any other documents
(please specify)

11.

I/We request the grant of patent on the basis of this application.

Signature

Date

2 March 2001

AS AGENTS FOR THE
APPLICANT

12. Name and daytime telephone number of person to contact in the United Kingdom

Mr E A LONG

(0114) 276 9381

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7/77

The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

**Statement of inventorship and of
right to grant a patent**

1. Your reference **EAL/AH-P/6097.GBA**

2. Patent application number **0105126.7**
(if you know it)

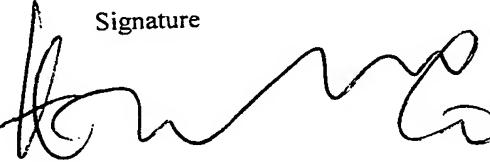
3. Full name of the or of each applicant **LAND INSTRUMENTS INTERNATIONAL LIMITED**

4. Title of Invention **GAS SAMPLE PROBE FOR A GAS ANALYSER**

5. State how the applicant(s) derived the right
from the inventor(s) to be granted a patent **BY VIRTUE OF AN AGREEMENT DATED 27/08/01
AND AN ASSIGNMENT DATED 27/08/01**

6. How many, if any, additional Patent Forms **NONE**
7/77 are attached to this form?
(see note (c))

7. I/We believe that the person(s) named over the page (and on
any extra copies of this form) is/are the inventor(s) of the invention
which the above patent applications relates to

Signature  Date

5 September 2001

AGENTS FOR THE APPLICANT

8. Name and daytime telephone number of
person to contact in the United Kingdom **Mr E A LONG
(0114) 276 9381**

Notes

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- Once you have filled in the form you must remember to sign and date it.

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Title of the Invention**GAS SAMPLE PROBE FOR A GAS ANALYSER****Field of the Invention**

This invention relates in a first aspect to a gas sample probe for a portable gas analyser,
5 and in a second aspect to an analyser provided with such a probe.

Background of the Invention

Portable gas analysers are known for use in the measurement of the concentration of gas
in stacks and ducts of industrial processes for the purpose of emissions monitoring, and
combustion control. In practice, the analyser extracts a small amount of gas from the flue usually
10 via metal tube mounted in the stack and a length of hose. In order to assure accuracy of
measurement, it is necessary to remove the water content from the gas, usually by means of a
cooler. Traditionally such coolers require electrical power (usually mains), are bulky and not very
practical to use with a portable analysers which are usually battery powered.

Object of the Invention

15 A basic object of the invention is the provision of an improved gas sample probe and
portable gas analyser.

Summary of a first object of the Invention

According to a first aspect of the invention, there is provided a gas sample probe for a
portable gas analyser, where the probe comprises an integral cooler or chiller operable by means
20 other than electrical power, through which cooler or chiller the gas sample is passed prior to being
conveyed to a gas analyser.

Summary of a second aspect of the Invention

According to a second aspect of the invention, there is provided a battery powered, portable
gas analyser in combination with a probe in accordance with the first aspect.

25 **Advantage(s) of the Invention**

The integration of a non-electrically powered cooler or chiller into the probe firstly ensures
that the required removal of water vapour from the gas sample may be satisfactorily achieved

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before the sample is introduced into the analyser, thereby avoiding inaccurate analysis due to the presence of water vapour, and secondly ensures that there is neither a drain on the battery capacity nor a requirement for increased battery capacity for activation of the cooler or chiller, whilst the rate and volume of gas flow through the cooler or chiller can be readily adjusted on site, by known control techniques, to ensure that for whatever gas temperature is involved - which will of course vary from site to site - there is sufficient dwell time of the gas sample within the cooler or chiller, for the dew point to be attained, so that the gas sample is then left "dry", allowing the analyser to make a true "dry" measurement.

Preferred or optional features of the Invention

10 The cooler is attached to an industry-standard sample probe.

The cooler forms the handle of the sample probe and a connection is provided for a hose to transfer the gas sample to the gas analyser.

The cooler comprises a vessel adopted to contain a measure of crystals to which tap water is then added to initiate an endothermic chemical reaction.

15 The crystals are of potassium bromide.

The vessel also houses an expansion chamber for the gas sample, the chamber having an inlet, and an outlet for the gas sample, and the chamber being subjected to the cooling effect of the endothermic reaction, whereby sufficient heat is removed from the gas sample flowing through the chamber to attain the dew point.

20 A catch pot is associated with the expansion chamber to collect water that is condensed out of the gas sample by lowering of the temperature of the gas sample through its dew point.

Drawing

One example of probe in accordance with the first aspect is shown in the accompanying diagrammatic drawing.

1/1 INFORMATION

